CHAPTER 2 - PROPOSED ACTION AND ALTERNATIVES

2.1 PROPOSED ACTION

The Proposed Action would involve the drilling, completion and operation of up to 12 additional natural gas well locations by the Wind Dancer Unit (WDU) Operator, GMT Energy Corp. (GMT) and/or its partner and agent operator in the WDU, Cabot Oil & Gas Corporation (Cabot). A well location would consist of both the short-term and long-term contiguous surface disturbance from which one or more wells could be drilled. A well location may have a single well drilled from that location, or more than one (such as a twin well drilled to a different formation or target depth), but would be restricted to a single, contiguous location where total area of the disturbance is minimized. The maximum short-term surface disturbance associated with a well pad capable of containing multiple locations would be approximately four acres. The actual number of well locations would be determined as development progresses and further analysis of the reservoir quality can be made, however the decision record for this EA would allow no more than 12 well locations.

The project is known as the Wind Dancer Natural Gas Development Project (WDNGDP) and the project area consists of approximately 6,400 acres. Currently, there are 5 existing producing well locations within the project area. If all 12 new well locations are developed, there would be a total of 17 well locations in the WDNGDP. Average well location density would be one per 376 acres upon project completion, if all proposed well locations were to be developed. A listing of existing and proposed wells within the Wind Dancer Unit is indicated in **Table 2.1**.

Table 2.1 Well List, WDNGDP

Well	Location	Sec.	Twp.	Rge.	Lease	Status
Wind Dancer Unit 40-21	1,184' FSL 1,208' FWL	21	24N	96W	WYW132366	Existing
Wind Dancer Unit 40-28X	1,322' FSL 1,289' FWL	28	24N	96W	WYW132367	Existing
Wind Dancer Unit 40-28	1,315' FSL 1,413' FWL	28	24N	96W	WYW132367	Existing
Wind Dancer Unit 20-29	1,263' FNL 1,359' FEL	29	24N	96W	WYW132368	Existing
Haystack 30-4	1,325 FNL, 1,233 FEL	30	24N	96W	WYW125284	Existing
Wind Dancer Unit #34-20	590' FSL 1,830' FEL	20	24N	96W	WYW131838	Proposed
Wind Dancer Unit #34-21	660' FSL ,980' FEL	21	24N	96W	WYW132366	Proposed
Wind Dancer Unit #12-27	1,981' FNL 561' FWL	27	24N	96W	WYW148513	Proposed
Wind Dancer Unit #14-27	784' FSL 592' FWL	27	24N	96W	WYW148513	Proposed
Wind Dancer Unit 32-28	2,107 FNL, 1947 FEL	28	24N	96W	WYW125289	Proposed
Wind Dancer Unit 34-28	681 FSL, 1,923 FEL	28	24N	96W	WYW125289	Proposed
Wind Dancer Unit #34-29	646' FSL 2,158' FEL	29	24N	96W	WYW132368	Proposed
Wind Dancer Unit #12-29	1,980' FNL 1,120' FWL	29	24N	96W	WYW132368	Proposed
Haystack 11	1,320 FNL, 1,316 FEL	30	24N	96W	WYW125284	Proposed
Wind Dancer Unit #32-32	1,992' FNL 2,145' FEL	32	24N	96W	WYW132369	Proposed

Well	Location	Sec.	Twp.	Rge.	Lease	Status
Wind Dancer Unit 12-33	1,980 FNL, 660 FWL	33	24N	96W	WYW132370	Proposed
Wind Dancer Unit #32-33	1,980' FNL 1,980' FEL	33	24N	96W	WYW132370	Proposed

The anticipated natural gas production will be from Cretaceous-age sandstone formations. Anticipated objective formations are the Lance and Lewis formations, and the Mesaverde Group, including the Almond, Ericson and Rock Springs formations. Individual well depths would range from 6,000 feet to 13,000 feet depending on the actual objective formation.

All activities would be conducted according to the regulatory requirements of the BLM and the Wyoming Oil and Gas Conservation Commission (WOGCC). The project would begin in the summer and fall of 2004 and continue for approximately twelve months, ending in fall, 2005. It is estimated that approximately 4.75 miles of additional roads and approximately 4.75miles of additional pipelines would be needed to service the well locations. The program would require one drilling rig operating continuously. It is possible that a second rig would be added during the summer and fall peak drilling periods. The level of activity would be determined by a number of factors, some of which are weather, lease wildlife stipulations, drilling rig availability, and product price.

Prior to commencement of drilling for each well, the Operator would file with the BLM and the WOGCC an Application for Permit to Drill (APD) containing technical drilling information and surface use information. As all acreage consists of federal leases, the drilling plan and surface use plan would be in conformance with Federal Oil and Gas Onshore Orders Nos. 1 and 2. There are no well location proposals on state or fee mineral ownership. This EA will disclose and analyze the site-specific effects of the Proposed Action in detail. Any further necessary site-specific protection measures or operational requirements for the well could be addressed as attached Conditions of Approval (COA) in the APD permitting process. Separate Right-of-Way (ROW) permits would be obtained for access roads outside of the WDU. Pipeline easements would be filed for under the ROW process as well. The specific requirements and mitigation for individual well locations, roads, and/or pipelines are reviewed, discussed and approved within these filings. Site-specific environmental analyses may be required for a well location and/or portion of pipeline if deviation from the proposed action is required subsequent to a decision for this EA. Many of the issues addressed in the individual APD's and ROW filings are discussed below. See **Appendix B** for a listing of all government agencies with jurisdiction on this project.

There are no state or fee lands within the WDNGDP area. If access outside of the project area were necessary, surface agreements with private surface owner(s) would be completed prior to conducting well location, pipeline and road construction.

2.1.1 Construction, Drilling, and Completion

The WDNGDP Proposed Project was developed in consultation with the BLM and in consideration of comments received during public scoping. The 30 day public scoping period ended May 17, 2004. Comments were received from 14 individuals, groups, or government agencies. The Proponent and its contractors met with BLM Project Interdisciplinary Team (ID

Team) staff March 19, 2004 to review the comments and incorporate suggestions from the comments, where warranted, into the EA.

Onsite inspections were conducted for 11 of the 12 proposed wells by BLM ID Team members and Proponent's contractors April 19, 2004. Onsite inspection for the Haystack 11 location had been conducted in 2002. At that time, the BLM questioned possible flooding issues associated with high water in the Hay Reservoir. The reservoir, which had been breached and inactive for many years, was recently repaired by the landowner and is again capable of storing water during runoff periods. The Operator plans on a modified and elevated well pad and access roads to ensure that abnormally high water in the reservoir would not impede access to the well location. The Operator has provided a survey that substantiates its claim that the elevation of the Hay Reservoir spillway is below the elevation of the proposed well pad (Bargsten, 2004, personal communication).

During the onsite inspection, well locations, access roads, and pipeline routes were examined and determinations were made as to the necessity of application of COAs during the APD process. Modifications to sites were made, as determined necessary by BLM to provide acceptable locations for the proposed activities. In addition, numerous mitigative measures have been incorporated into the Proposed Action, as indicated in **Appendix B.**

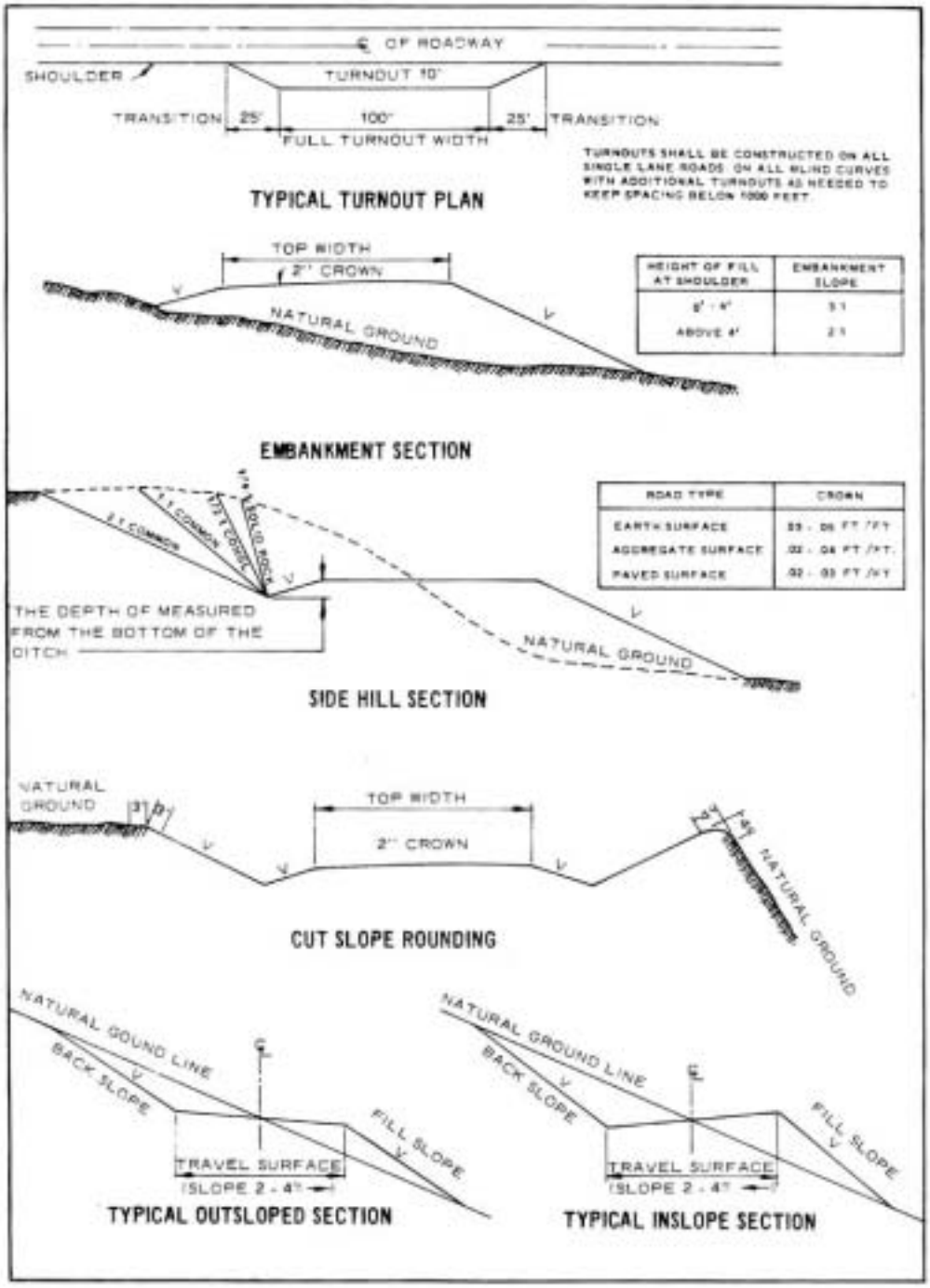
2.1.1.1 Access Road Construction, Road Use, and Transportation Plan

Currently, there are approximately 11.56 miles of roads which service well locations within the Project Area, as indicated on **Figure 1.2**, the Proposed Action. Roads in the WDU are generally of two classifications: 1) Local Road (double lane) and 2) Resource Road (single lane). It is estimated that an additional 4.75 miles of proposed resource roads would be needed to access proposed well locations. The locations of these proposed roads are shown on **Figure 1.2**. Roads would be constructed in accordance with the specifications outlined in the BLM Road Standards Manual, Section 9113 and the BLM/USFS Gold Book as shown in cross section on **Figure 2.1**. Surface disturbance would generally be less than 40 feet in width, but occasionally surface disturbance widths of up to 60 feet could result where unique conditions (such as requirement of flat-bottomed ditches) dictate. The typical travel surface would be between 14 and 16 feet wide with turnouts as per BLM-9113 as noted above.

Local contractors would be used for the construction of each road. Two or three people would be needed for construction. The length of time to complete each road would vary. A well location access road of approximately 1/2 mile would take one or two days depending on weather conditions. All roads would be constructed with native materials and maintained to provide safe operating conditions at all times as determined by the BLM. Surfacing with gravel, scoria, or other approved materials would be used where required by BLM. Brush would be removed and windrowed along the road. The topsoil would be windrowed as specified in the APD or ROW grant. Some topsoil would be removed from roads and used to reclaim cut slopes on permanent roads.

Figure 2.1 Typical Roadway Construction Plans

(Source: Surface Operating Standards for Oil and Gas Exploration and Development ("Gold Book"), 1989



During the construction, drilling, and completion phases of the Project there would be approximately 10 vehicle trips per day to and from the proposed well location, including 50% light truck traffic and 50% transport or heavy truck traffic. During the operation, reclamation, and maintenance phase of the Project, there would be approximately 1-3 trips per day. Vehicles utilized would include pickup trucks for personnel transportation, flatbed semi-trailer trucks for transporting construction implements, rig components, tanks, and casing, and other intermediate size trucks for activities such as water hauling, well logging and perforating.

Authorization from the BLM would be obtained prior to any road construction activity through the APD and/or ROW process. Other proper authorities would be consulted as necessary. Operator would obtain all necessary federal, state, and local permits necessary for conducting operations prior to implementation and construction.

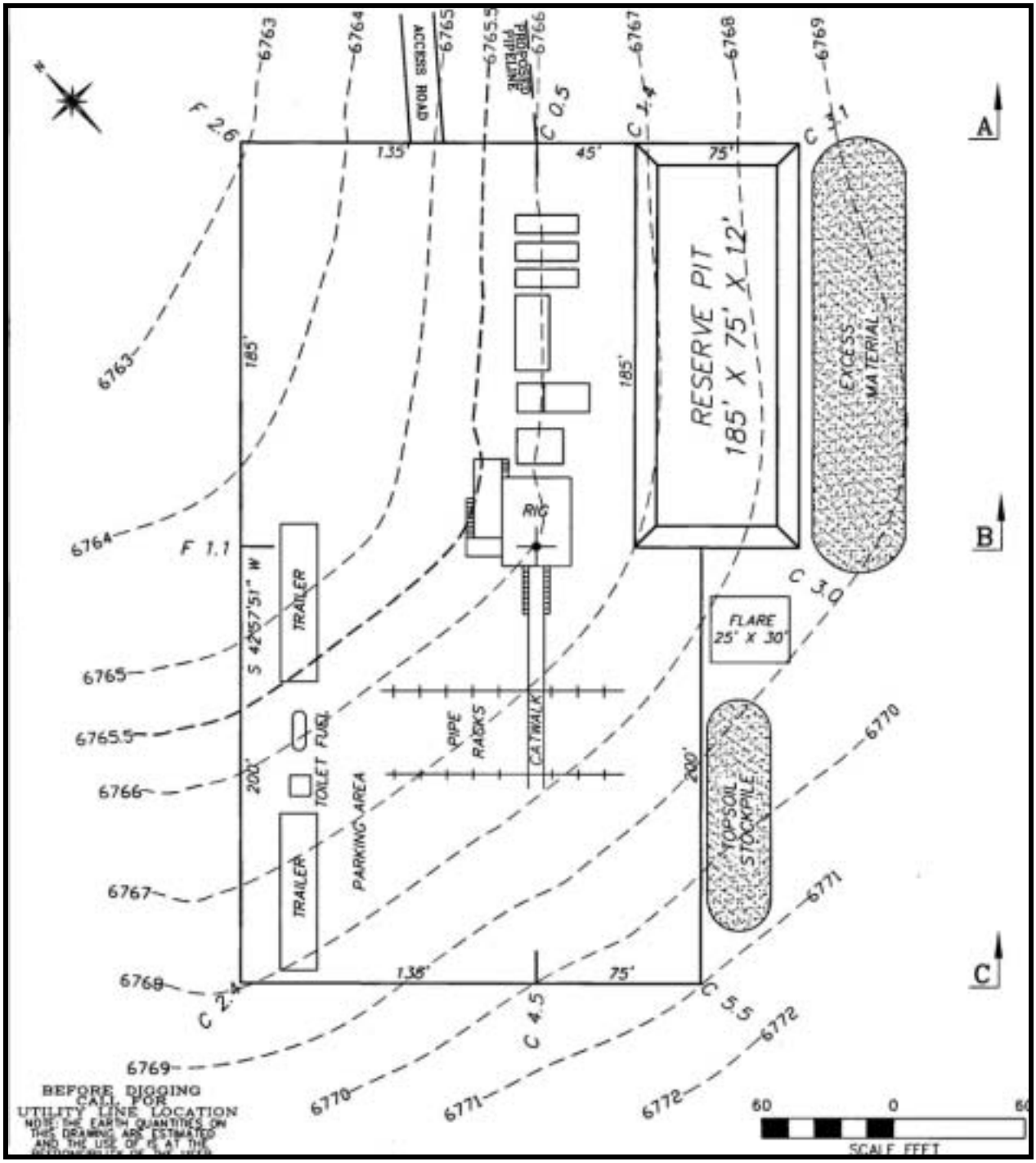
2.1.1.2 Well Location Construction

The surface disturbance area for each well location, including reserve pit, cut/fill side slopes and soil stockpiles, would be up to 4 acres in size. It is anticipated that this size would be required for safety during drilling and completion operations (assuming two wellbores drilled from a single well location). If only one wellbore were to be drilled from a well location, the disturbance area would be approximately 2.7 acres in size. Well location preparation would require that vegetation and topsoil be removed. Depending on the site-specific conditions and available topsoil in place, 2-12 inches of topsoil would be removed and stockpiled. The amount would be determined by the Operator and the BLM at the time of the onsite meeting during the APD process. The topsoil would be separated from excess "cut" material and stockpiled for future use in reclamation. The well location would be leveled using standard cut-and-fill construction techniques and construction machinery. **Figure 2.2** shows a typical drilling well location layout.

A reserve pit would be excavated at each well location to temporarily store drilling fluids (mud), rock cuttings, and any water which may be produced during drilling. It is estimated that a total of 5,000-20,000 cubic yards of material would be excavated with the construction of each well location and associated reserve pit. Approximately 15% of excavated material would be topsoil, 50% would be reserve pit contents, and 35% would be the cut material from the well pad. Where considered necessary by the Operator, or at the requirement of the BLM, reserve pits would be lined. The liner would be made of synthetic material of sufficient size and qualities to sustain a hydraulic conductivity no greater than 1×10^{-7} cm/sec after installation, and which is sufficiently reinforced to withstand normal wear and tear associated with the installation and use thereof. The liner would be chemically compatible with all substances which would be placed in the pit. All reserve pits would be fenced with woven-wire stock fence as typically required by specific permit to ensure that wandering wildlife or livestock do not intrude. Netting or flagging would be installed over the pit to protect wildlife species, in particular waterfowl, if potentially harmful or toxic substances are discharged to the reserve pit.

Figure 2.2 Typical Drilling Well Location Layout

Source: GMT Energy Corp.



2.1.1.3 Drilling Operations

It is anticipated that the project could be completed using one drilling rig with the possibility that a second rig could be added. The rigs would be of sufficient size to be capable of drilling wells to a total depth of approximately 12,000 feet. Rigging-up, the preparation of the rig for drilling at the site, typically requires 1-3 days and employs approximately 20 people for construction. The drilling phase is estimated to take approximately 30 days. During that time there would be from 5 to 12 people at the well location, with possibly twice that number during shift changes. As many as 4 supervisory people could be residing at the location during various times of the drilling phase. This would include the Operator's representative, wellsite geologist and/or mud logger, and drilling contractor's tool pusher (supervisor), all of whom would reside in trailers onsite and located on the well pad. On occasion, some contractors provide a bunkhouse on location which would house 8 drilling personnel for several days at a time. This would reduce the number of vehicle trips per day by two.

Sewage disposal facilities require Wyoming Department of Environmental Quality (WDEQ) approval. Facilities would be self-contained chemical toilets and waste would be disposed of in accordance with state and local regulations. Garbage would be contained in a portable trash cage totally enclosed with small mesh wire and would be transported to an authorized disposal facility at the completion of operations.

The drilling rigs are powered by diesel engines. Diesel fuel is supplied to the well location during drilling and completion operations by tanker truck, and is stored onsite in tanks during operations. Excess diesel fuel is hauled from the site at the end of drilling and completion activities.

Drilling fluids, known as muds, are used to lubricate and cool the drill bit, raise drilled rock cuttings to the surface, help protect fresh water zones, and help control underground pressure while drilling the well. The muds would consist primarily of fresh water and powdered bentonite, a natural clay. Surface drilling would be done with bentonite gel/fresh water. Near total depth, a gel-polymer/fresh water system would be used. Muds would be mixed on location from dry and liquid components hauled to the rig from nearby towns, and water from the Luman water well #2 (SWSW Section 25, T24N, R97W). All drilling mud additives, once used for drilling activities, are classified as exempt (non-toxic) under the Resource Conservation and Recovery Act (RCRA) guidelines. The specific mud program for each well would be included in the APD.

All drilling programs would include a string of conductor casing (+16 inch diameter) set at a depth of 40-80 feet. Surface casing (8-5/8 or 9-5/8 inch diameter) would be set at a minimum depth of 1,500 feet and cemented from total depth to surface. Casing setting depths and cement programs would be stated in the APD, reviewed and approved on a well-by-well basis, and would comply with Onshore Order #2. An 11-inch blowout preventer (BOP), rated at 5,000 pounds per square inch (psi), would be installed on the surface casing prior to drilling to total depth. The BOP would be pressure-tested at installation and at other required intervals per Onshore Order #2.

2.1.1.4 Completion Operations

Production casing (4½ or 5½ inch diameter) would be installed from total depth to surface for all wells anticipated to produce gas (See well bore diagram, **Fig. 2.3**). Production casing would not be installed in any wells that are determined to be uneconomical. Any well determined to be uneconomical would be plugged and abandoned per BLM and/or Wyoming Oil and Gas Conservation Commission requirements (See Section 2.1.3 Reclamation and Abandonment, below). Casing would be cemented in place by a well cementing service company crew using specialized equipment which mixes dry cement and water into a slurry, and which is then pumped down the well. During the running-in and cementing of the production casing, an additional eight people would be on location.

Once the production casing is cemented in place, the drilling rig would be moved off the location. Completion procedures would then be carried out with a smaller service rig. After ensuring that the casing is cleaned out, a cement bond log would be run to evaluate the adequacy of the cement. Upon determining that the cement sheath is adequate, the producing formation would be perforated. If the sheath were determined to be inadequate, additional cementing would be completed. The perforating of the casing and cement sheath would be accomplished by a perforating tool assembly, which fires shaped explosive charges. These charges penetrate the casing, cement, and producing formation. The holes allow formation fluids (primarily natural gas and condensate at Wind Dancer) to enter the wellbore. During completion operations, 3-30 people would be on location, including service rig crew, perforating and/or other service company personnel, and supervisory personnel.

2.1.1.5 Well Stimulation/Production Testing

After perforating, the well would be allowed to flow if it were capable of doing so, and the produced fluids would be measured or estimated. Typically, because the sandstone producing zones at the WDNGDP have low permeabilities, the wells often require fracture stimulation. This treatment would be done by pumping fluids (typically polymer-gelled fresh water) down the wellbore and into the formation under pressures sufficiently high to fracture the rock formation. Sand grains, glass beads, or other similar materials, called proppants, are carried in suspension by the fluids into the fractures. These proppants remain when the pumping ceases. The polymer is designed to break down within a few hours and the thinned fluid is allowed to flow back to the surface at controlled rates. The remaining proppant prevents closure of the induced fractures and allows the reservoir fluids to flow more efficiently into the wellbore. Hydrocarbon liquids would be separated and stored in steel tanks on location until removed for sale. Fresh water would be flowed to a reserve pit during production testing and allowed to evaporate.

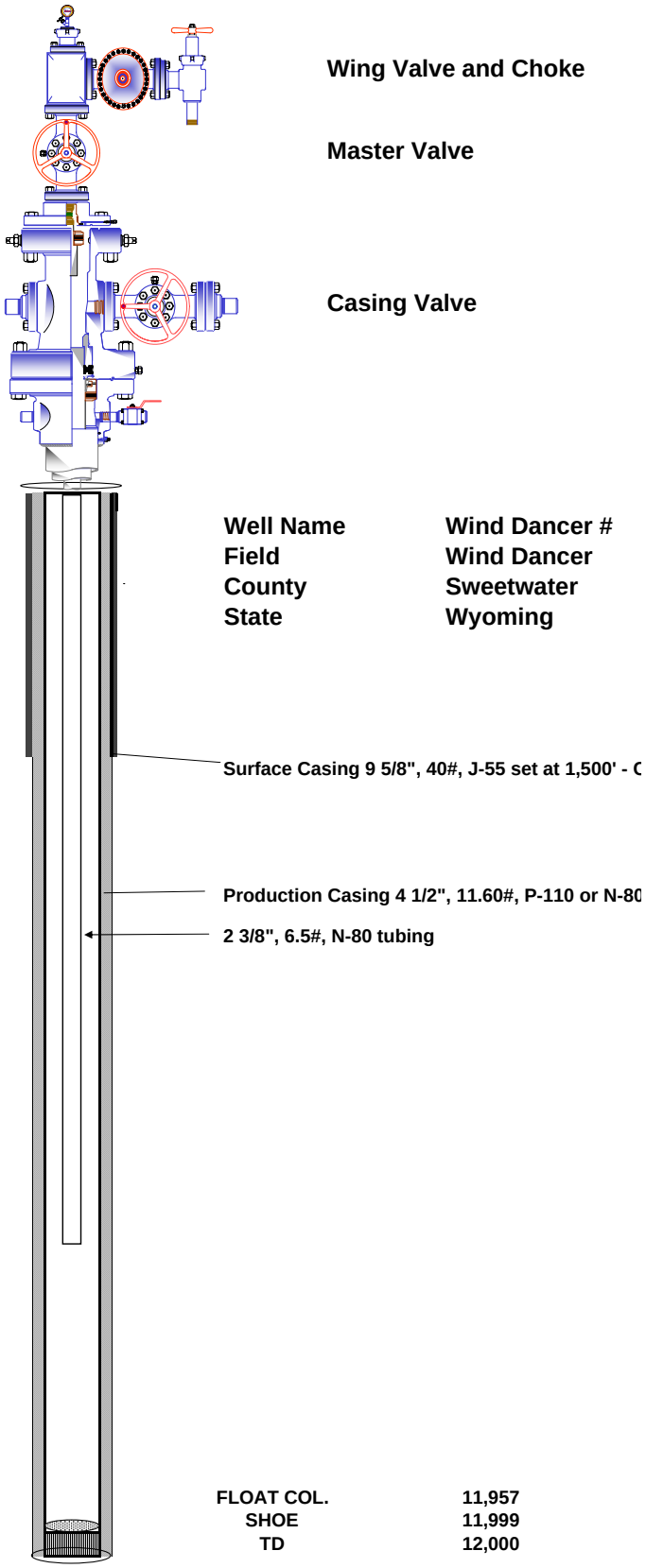
Six or seven people would likely be on location during production testing, but nearly all would be commuting to the location except for the testing personnel who are on location 24 hours per day. Production testing for WDNGDP wells is anticipated to take 3-15 days.

Figure 2.3 Well Bore Diagram

GMT Energy Corp

Wind Dancer Unit

Typical Lewis/Almond Completion



2.1.1.6 Production Facilities

Once the well has been tested and determined to be economically feasible, it would be equipped for production. Tubing would be placed in the well to conduct the flow of gas and liquids to the surface. The tubing string also provides a safety measure by causing any deterioration to take place on the tubing, which is removable and repairable, instead of the permanent production casing. **Figure 2.3** shows the tubing string inside the casing.

A series of valves (the "tree"), designed to regulate the flow of gas and liquids from the well, would be installed on top of the wellhead, which is in turn attached to the casing (**Figure 2.3**). Pressure gauges would be installed on the wellhead and tree to monitor casing and tubing pressures and maximize well production.

Once the gas passes through the tree, it is routed to a gas production unit, which is a high pressure, separator that isolates the three phases of the well production, 1) natural gas; 2) condensate and; 3) water. The natural gas enters a sales pipeline, the liquids flow to tanks. **Figure 2.4** is a schematic of a productive well location. Condensate would be diverted to separate storage tanks for eventual sale. Condensate would be removed by tanker truck. Produced water, if any, would be flowed to a tank for eventual transportation to an approved water disposal facility (See Part 2.1.2 below regarding disposition of produced water).

In order to maintain aesthetic values, all permanent and semi-permanent facilities would be painted Munsell Soil Color Chart "Carlsbad Canyon (2.5Y 6/2)" standard environmental color.

Firewalls/containment dikes would be constructed and maintained around all storage facilities/batteries. The containment structure will have sufficient volume to contain, at a minimum, 110% of the entire contents of the largest tank within the facility/battery, per Spill Prevention Control and Countermeasure Plan regulations as required under 40 CFR, Part 112.

2.1.1.7 Ancillary Facilities

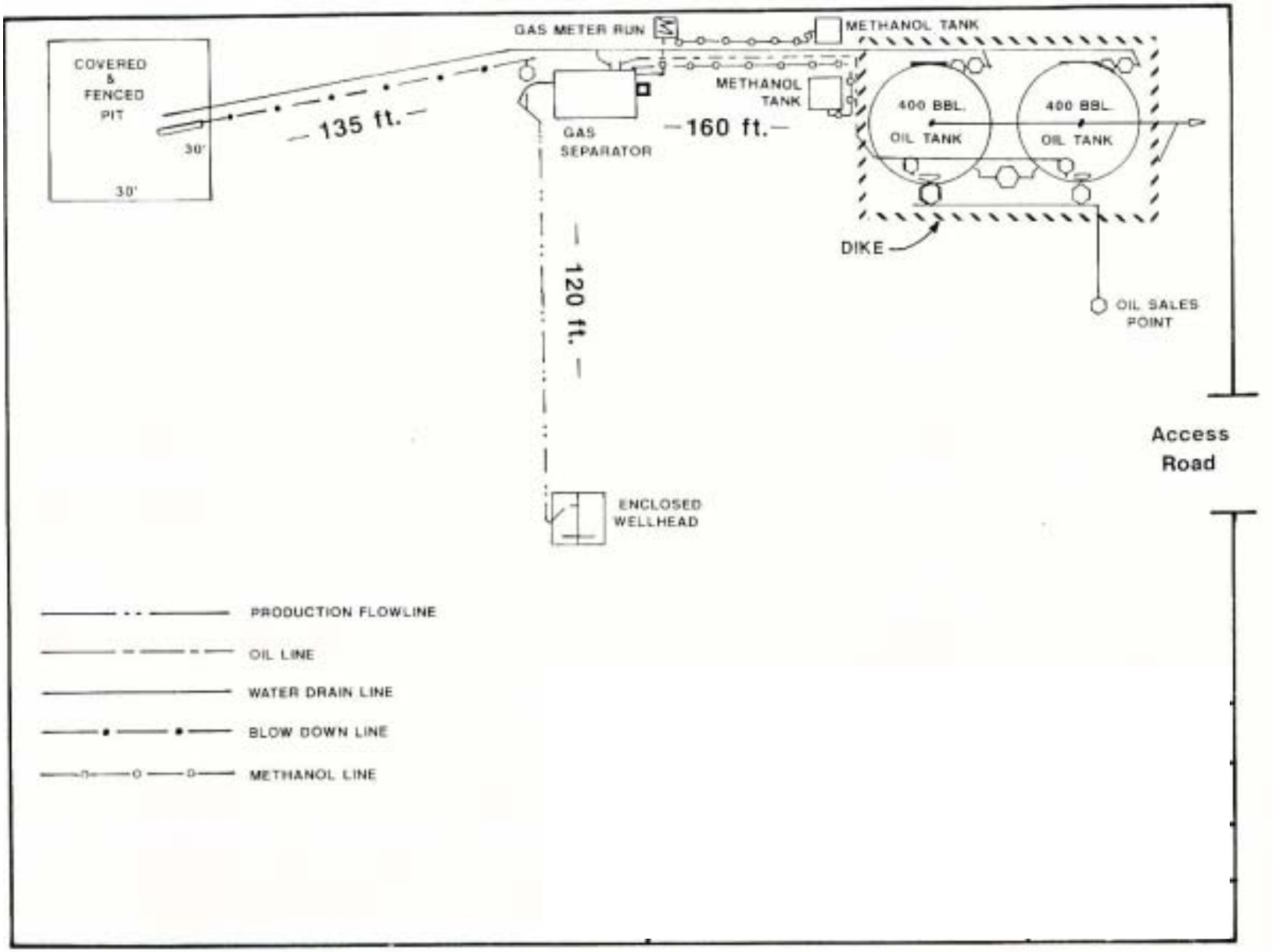
There are currently no compressors or major treatment facilities located in the WDNGDP. Based on anticipated production rates, capacity of the existing infrastructure, and current production rates, compressors or major treatment facilities may be required for optimum production efficiency in the future. The proposed WDNGDP is designed to provide the production data necessary to design the field operating systems. No ancillary facilities are proposed, however, under the Proposed Action.

2.1.1.8 Pipelines

Currently, there are approximately 9.74 miles of pipeline serving the existing wells within the WDNGDP as identified on **Figure 1.2**. It is estimated that an additional 4.75 miles of pipeline would be needed to service the additional wells that would be drilled. Several of the locations or routes of these pipelines are identified at this time. (**Figure 1.2**). The main pipeline system interconnect to the Red Desert Plant is adequate to handle the anticipated additional production.

Figure 2.4 Typical Producing Well Location Layout

Source: GMT Energy Corp.



Authorization for any additional or new pipelines would be applied for separately through the BLM ROW application or APD process.

New natural gas pipelines would become part of the existing gas transportation system owned and operated by Mountain Gas Resources, Inc. which is a subsidiary of Western Gas Resources. All necessary authorizing actions for natural gas pipelines would be addressed on a case-by-case basis. New gas-gathering pipelines would be 6 inches in diameter and the distance from a new well to the existing gathering system would average one half mile. The maximum width of the pipeline construction ROW and short-term disturbance width would be 50 feet. The ROW would be placed adjacent to existing roads and pipelines where possible. **Figure 2.5** illustrates typical pipeline installation procedures within a 50-foot ROW adjacent to an existing pipeline. Following completion of construction, the permanent pipeline ROW would be reduced to a width of 30 feet.

From the proposed gathering pipelines, gas would be transported beyond the Project Area by a proposed Mountain Gas Resources pipeline to the existing Hay Reservoir Compressor Station, located in NWNE Section 17, T23N, R96W. The proposed pipeline would be an 8 inch diameter, steel pipeline with a maximum operating pressure of approximately 1,200 psig. The proposed pipeline would extend from the 6 inch gathering pipeline network from a point near the Wind Dancer Unit 32-32 proposed well location, SWNE Section 32, T24N, R96W. The pipeline would extend in a direction nearly due south to the compressor. Total length of the proposed 8 inch pipeline would be approximately 2.96 miles. The maximum width of the pipeline construction and operational ROW and short-term and long-term disturbance width would be 50 feet. The ROW would be placed adjacent to an existing road along most of its length. Hydrostatic pressure testing would not be conducted. The route of the proposed pipeline is illustrated in **Figure 2.6.**

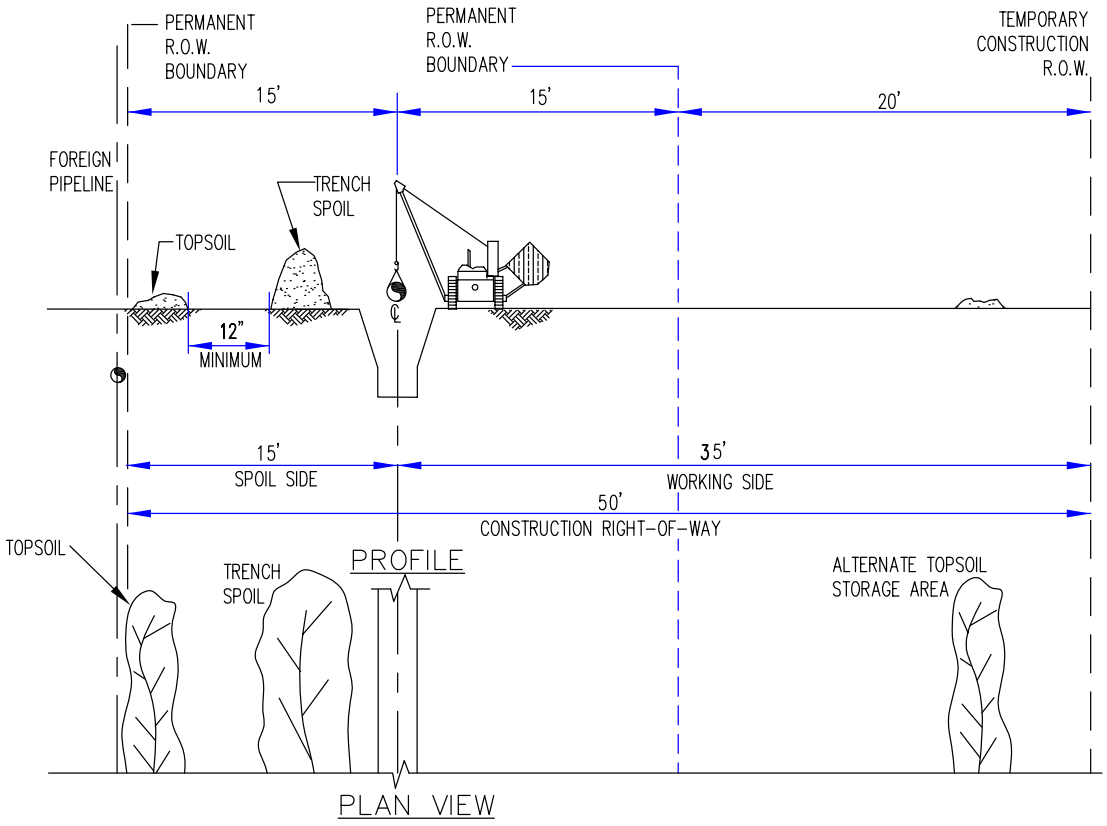
Construction methods are specified in the individual Application for Right-of Way, Plan of Development. These would be reviewed and approved or modified as agreed to by BLM and Western Gas. Construction details, including topsoil stripping, trenching, pipe type and installation, backfilling, ripping compacted surface, topsoil replacement and reseeding would be considered at this time. Additionally, technical points of pipeline design such as location and number of clean-out ports or “pig launchers” and “pig receivers” would be stated, as well as pressure test methods and maximum test pressures. Pressure testing would be completed before the trenches would be backfilled. Location of pipelines and the clean-out “pig launchers” and “pig catchers” would conform to the existing transportation system and would be designed to minimize travel off existing roads and/or production locations. It is estimated that well hook-up would occur 30-60 days after the well would be completed.

Figure 2.5 Typical Pipeline Installation

Source: Western Gas Resources

Full Width ROW Topsoil Salvage

Document No. RV_PL–1016A



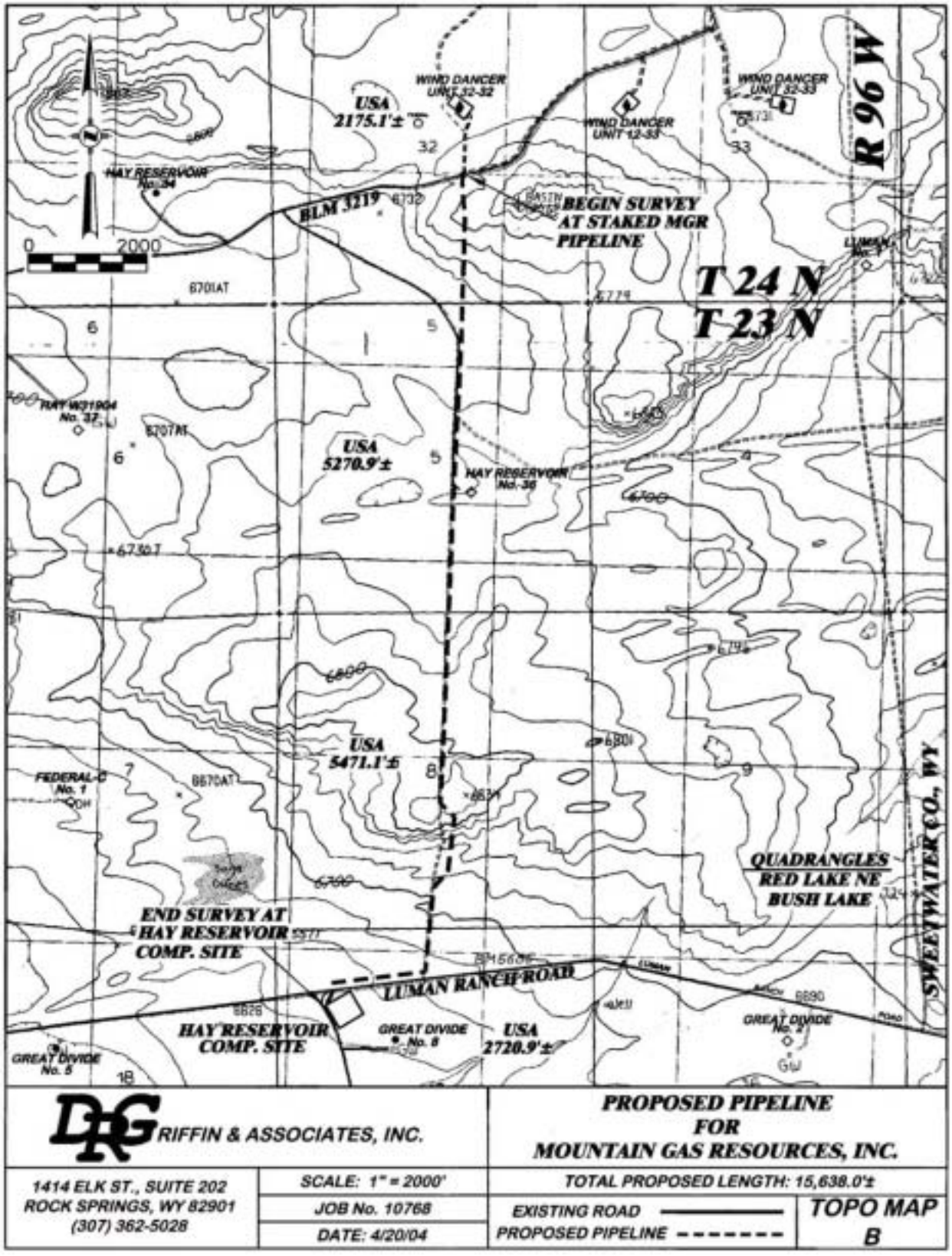
NOTES:

1. Utilize the double ditch topsoil salvage method as required by landowner agreements, and as directed by inspector.
2. Segregate 6 inches of topsoil from width of the ROW.
3. Stockpile topsoil as shown, maintaining 12 inches separation between topsoil and spoil piles.
4. Keep topsoil and spoil piles clean of all construction debris.
5. Leave gaps in the topsoil and spoil piles at obvious drainages. Do not push upland soils into creeks or wetlands. Do not use topsoil for padding.
6. Avoid scalping vegetated ground surface when backfilling spoil and topsoil piles.
7. Topsoil and trench spoil positions can be adjusted to fit the site as approved by inspector.

MGR Mountain Gas Resources, Inc.

NO.	DESCRIPTION		
CHECKED	DATE	APPROVED	DATE

Figure 2.6 Mountain Gas Resources Proposed 8 Inch Gas Pipeline



Within 12 months of the installation of additional pipelines, the ground would be returned to natural contour, and seeded with a seed mix as agreed upon by Western Gas Resources and the BLM (see Section 2.1.3 for typical seed mixes).

2.1.2 Production Operations and Maintenance

In the vicinity of the WDNGDP, wells produce in a range of 200 thousand cubic feet of gas per day (MCFD) to over 5 million cubic feet of gas per day (MMCFD), between 1 and 30 barrels of condensate per day (BCPD), and a range of 1 to 30 barrels of water per day (BWPD),. The gas would be transported from the well by pipeline, and the condensate would be hauled out by tanker truck at such time as approximately 240 barrels were accumulated in the storage tanks. Produced water would be managed per Onshore Order #7. All produced water will be temporarily stored on-site in tanks, and then trucked in 80-120 barrel quantities to an approved disposal facility.

2.1.2.1 Maintenance

Routine maintenance of the producing wells would be necessary to maximize performance and detect operational difficulties. Company personnel, known as pumpers, would visit each well location daily to ensure that operations are proceeding efficiently and safely. This visit would include, but would not be limited to, checking gauges, valves, fittings, and on-site water and condensate storage. Routine on-site equipment maintenance would also be performed.

Pipelines would be periodically patrolled and inspected by pipeline personnel on foot or by vehicle to check for problems such as erosion, right-of-way condition, unauthorized encroachment and any other situations which could cause a safety hazard or require preventive maintenance.

The Operator would be responsible for preventive and corrective road maintenance on all areas covered by the ROW grant and approved APD, from the beginning to completion of operations and as affected by their operations. On roads under BLM jurisdiction with multiple rights-of-way issued, the Operator will enter into a joint maintenance agreement with all other ROW holders. This would include, but not be limited to, snow removal, blading the roadways, cleaning ditches and drainage facilities, or other requirements as directed by the Authorized Officer. Weed control is by spraying herbicides as necessary. Prior to herbicide application, the BLM would be contacted and a Pesticide Use Permit obtained. Where necessary and required by BLM, gravel would be placed on roadways.

2.1.2.2 Workovers

If a well’s performance is considered by company personnel to be below its potential, the well would be subjected to remedial action, known as a "workover", to improve its production. This action could entail removing the production tubing from the well, stimulating the formation, cleaning obstructing material from the well, or other activity. Workovers for the types of wells with an average production rate of less than 5 barrels of water per day (BWPD), would be performed with a truck-mounted completion rig. Workovers occur an average of once every 5

years. The traffic associated with a workover would be similar to that of a completion. However, it takes approximately 10 days for a workover as opposed to 15 days for a completion. Fluids generated during workover operations would be handled as indicated above in Section 2.1.1.4, Completion Operations and Section 2.1.1.5, Production Testing.

2.1.2.3 Characteristics of Produced Gas

The Lance, Lewis, Almond and Ericson gas streams consist predominately of methane gas with some heavier hydrocarbon gases. Trace amounts of nitrogen and carbon dioxide are produced. Hydrogen sulfide gas (H_2S) is not present in the gas streams.

2.1.3 Reclamation and Abandonment

The Wyoming State Office has issued the following goal statement with respect to reclamation (Instruction Memorandum No. WY-90-231):

> The Wyoming BLM's primary long-term goal for reclamation is eventual ecosystem reconstruction. This means to return the land to a condition approximate or equal to that which existed prior to disturbance or to a stable and productive condition compatible with that described in the land use plan. Our short-term reclamation goal is to immediately stabilize disturbed areas and protect both disturbed and adjacent undisturbed areas from unnecessary degradation.

The Operator intends on complying with BLM's reclamation policy. After installation of production equipment, the producing well location would be reduced from an area of approximately 4 acres to an area of approximately 1.5 acres (for a well location with multiple wellbores) and from an area of approximately 2.7 acres to an area of approximately 1.5 acres (for a well location with a single wellbore). All unneeded, previously disturbed areas would be recontoured, then "ripped" 12 inches to 18 inches deep to relieve compaction. Topsoil proportionate to the acreage reclaimed and consistent with the site-specific plan approved with the APD would be spread over the recontoured portion of the well location and would be reseeded within one or two years, subject to weather conditions and time of year of the reseeding. The depth of topsoil redistributed would be equivalent to the depth removed at time of construction. (See Section 2.1.1.2, Well Location Construction). The remaining topsoil stockpile would be stabilized by seeding with a recommended seed mixture and left in place until the well location is ultimately reclaimed at the end of its productive life. Reseeding would be performed on outside portions of the road disturbance not needed to maintain the road. This would be 6 feet or more on both sides of the road. Reseeding would also be performed over the entire disturbed area of the pipeline ROW's, reducing the overall disturbance area. The entire well location area and access roads for all unproductive locations would be reclaimed within two years, according to BLM requirements.

Seeding would take place during the spring or fall "seed window" as determined by the BLM, subject to weather conditions. Erosion control methods as agreed to by BLM and the Operator would be implemented. These could include water bars on contours, water diversion ditches,

and other methods as appropriate on a site-specific basis. Compacted soils will be ripped 12 to 18 inches deep prior to reseeding.

At the end of the project's useful life (10-30 years or more), the Operator would obtain any necessary authorization from the appropriate regulatory agency to abandon facilities. Orders for procedure to plug and abandon the wells and production facilities would be received from the BLM. Plugging and abandonment of a well would be consistent with the guidelines and regulations of the WOGCC. The gas wells would be permanently plugged, or temporarily shut-in until decisions are reached regarding future production options. Upon abandonment, the pipelines would be purged of all combustible products and retired in place to avoid unnecessary additional disturbance. All above-ground facilities would be removed, and all recontouring and reseeding of disturbed land areas (if applicable) would be completed. Abandoned ROWs would revert to the appropriate agency control.

When determining to abandon the facilities authorized by each grant and/or permit, the Operator would contact the Authorized Officer to arrange a joint inspection of the ROW and well location. The inspection would be held to review implementation of abandonment procedures and the reclamation plan.

All disturbed areas not needed for production which had previously been covered with vegetation would be stabilized and revegetated following the drilling phase. Surface areas that previously had no vegetation would not be seeded unless it is determined by BLM that removing and replacing soil material might improve conditions that would make vegetation growth possible.

All disturbed areas will be seeded with the seed mixture indicated in **Table 2.2**, in quantities which would be determined by the BLM and the Operator at the time of the APD or ROW application and which would be reviewed at the time of seeding.

Table 2.2 Proposed Reclamation Seed Mix

Species	Scientific Name	Variety	Pounds PLS/Acre*
Grasses			
Slender wheatgrass	Agropyron techycaulum		2.0
Thickspike wheatgrass	Agropyron dasystachyum	Critana	4.0
Western wheatgrass	Agropyron smithii		2.0
Indian ricegrass	Oryzopsis hymenoides		1.0
Bottlebrush squirreltail	Sitanion hystrix		1.0
Needle-and-thread	Stipa comata		1.0
Shrubs			
Gardner's saltbush	Atriplex gardnerii		1.0
Total			12.0

Cited seed rates are for drill seeding, in pounds pure live seed (PLS) For broadcast seeding, double the rates indicated.

Seed will be broadcast or drilled depending on site conditions. Applicant would monitor the reseeding on an ongoing basis and replant, if needed.

2.1.4 Summary and Mitigation Measures

Implementation of the Proposed Action would result in short-term and long-term disturbances to the surface. Long-term disturbance is that associated with the life of the Project. Short-term disturbance would occur during a portion of the Project life, typically prior to commencement of the production phase. Short-term disturbance would affect between 87.8 acres (all single well locations) and 103.4 acres (all multiple well locations), or 1.4% to 1.6% percent of the Project Area, respectively. Well pads represent the largest component of short-term disturbance. Interim reclamation would occur after a well is drilled, completed, and pipelines and compressor stations are installed. Interim reclamation restores areas not needed for production to their original state, or as close as possible. After interim reclamation takes place, the Proposed Action's disturbance would be reduced to approximately 61.9 acres, or 1.0% of the Project Area, for the long term.

A summary of short- and long-term disturbance associated with the Project is indicated in **Table 2.3**.

The results of the scoping process were used to develop alternatives for identified unresolved resource conflicts resulting from the Proposed Action. The BLM and the Operator have identified appropriate mitigation measures designed to minimize potential impacts from the Project. These measures have been incorporated by the Operator into the Proposed Action and are indicated in **Appendix B**.

The proposed facilities locations for the WDNGDP are illustrated in **Figure 1.2**, Proposed Action.

2.2 NO ACTION ALTERNATIVE

The National Environmental Policy Act (NEPA) requires that a “no action” alternative be considered in all environmental documents. For the WDNGDP proposal, the “no action” alternative would preclude the oil and gas development described in the Proposed Action within the lease and unit areas. The No Action alternative would not, however, preclude the future consideration or proposal of additional development. It is likely, furthermore, that the oil and gas resources in this area would continue to be developed outside the Unit at their current rate.

A decision to select this alternative could be supported by one of three findings:

Table 2.3 Disturbance Summary, Proposed Action

Location	Short- Term (Acres)				Total Short Term (Acres))		Long-Term (Acres)				Total Long-Term (Acres)	
	Well Pad (Single Locn.)	Well Pad (Mult. Locns.)	Pipeline	Access Road	Single Well Pad	Multi-Well Pad	Well Pad (Single Locn.)	Well Pad (Mult. Locns.)	Pipeline	Access Road	Single Well Pad	Multi-Well Pad
Haystack 11	2.7	4.0	2.7	0.8	6.2	7.5	1.5	1.5	1.6	0.8	3.9	3.9
WDU 34-20	2.7	4.0	2.5	0.8	6.0	7.3	1.5	1.5	1.5	0.8	3.8	3.8
WDU 34-21	2.7	4.0	1.4	0.4	4.5	5.8	1.5	1.5	0.8	0.4	2.7	2.7
WDU 12-27	2.7	4.0	2.6	0.8	6.1	7.4	1.5	1.5	1.6	0.8	3.8	3.8
WDU 14-27	2.7	4.0	2.5	0.7	5.9	7.2	1.5	1.5	1.5	0.7	3.7	3.7
WDU 32-28	2.7	4.0	1.9	0.6	5.1	6.4	1.5	1.5	1.1	0.6	3.2	3.2
WDU 34-28	2.7	4.0	3.1	0.9	6.7	8.0	1.5	1.5	1.8	0.9	4.3	4.3
WDU 12-29	2.7	4.0	3.7	1.1	7.5	8.8	1.5	1.5	2.2	1.1	4.8	4.8
WDU 34-29	2.7	4.0	3.9	1.2	7.7	9.0	1.5	1.5	2.3	1.2	5.0	5.0
WDU 32-32	2.7	4.0	1.3	0.4	4.4	5.7	1.5	1.5	0.8	0.4	2.7	2.7
WDU 12-33	2.7	4.0	0.9	0.3	3.9	5.2	1.5	1.5	0.6	0.3	2.3	2.3
WDU 32-33	2.7	4.0	2.4	0.7	5.8	7.1	1.5	1.5	1.4	0.7	3.6	3.6
MGR 8 in. pipeline	0.0	0.0	18.0	0.0	18.0	18.0	0.0	0.0	18.0	0.0	18.0	18.0
TOTALS	**32.4**	**48.0**	**46.7**	**8.6**	**87.8**	**103.4**	**18.0**	**18.0**	**35.2**	**8.6**	**61.9**	**61.9**

1) the level or rate of development is no longer in the best interest of the public;
2) endangered or threatened species and/or their habitat would be adversely affected; or
3) the environmental impacts of the proposed action are unacceptable.

Federal, state, and fee oil and gas leases grant the right and privilege to drill for, mine, extract, remove, and dispose of all the oil and gas deposits in the leased lands, subject to the terms and conditions incorporated in the lease. The denial of the right to drill could void the lessee's contractual rights.

2.3 ALTERNATIVES CONSIDERED BUT NOT ANALYZED IN DETAIL

Some of the issues obtained during the scoping process suggested potential alternatives to the Proposed Action. These issues have been examined and a determination has been made that:

- The suggested alternative is non-viable for reasons indicated, or
- Applicant-committed mitigation measures will eliminate or mitigate the concern.

Proposed alternatives are required to be technically and economically feasible and to provide the opportunity to achieve the Proposed Project (CEQ, Forty Questions, 2a). BLM-mandated directional drilling was considered as and alternative. However, it was decided that the geologic nature of the target horizons, comprising series of discontinuous, lenticular, low permeability sand reservoirs at both shallow and deep stratigraphic levels, rendered directional drilling technology technically and economically unfeasible.

The responses from the public scoping period were considered to identify any unresolved resource conflicts. The BLM determined that no unresolved resource conflicts remained, with mitigation, that would require analysis of additional alternatives.